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**Sustainability as a motivation for corporate transformation: internal and external  
drivers from a time perspective**

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## Table of Contents

Abstract.....	- 1 -
1. Introduction .....	- 2 -
2. Literature Review.....	- 2 -
2.1. <i>Drivers of Sustainability</i> .....	- 4 -
3. Research Question .....	- 5 -
4. Methodology.....	- 6 -
4.1. <i>Research design</i> .....	- 6 -
4.2. <i>Data Collection</i> .....	- 6 -
4.3. <i>Data Analysis</i> .....	- 7 -
5. Findings .....	- 7 -
5.1. <i>Ørsted</i> .....	- 7 -
5.1.1. <i>Transformation Story</i> .....	- 7 -
5.1.2. <i>Drivers</i> .....	- 8 -
5.2. <i>Neste</i> .....	- 10 -
5.2.1. <i>Transformation Story</i> .....	- 10 -
5.2.2. <i>Drivers</i> .....	- 11 -
5.3. <i>Siemens</i> .....	- 12 -
5.3.1. <i>Transformation Story</i> .....	- 12 -
5.3.2. <i>Drivers</i> .....	- 13 -
5.4. <i>Schneider Electric</i> .....	- 15 -
5.4.1. <i>Transformation Story</i> .....	- 15 -
5.4.2. <i>Drivers</i> .....	- 16 -
6. Discussion .....	- 18 -
7. Limitations .....	- 24 -
8. Conclusion .....	- 24 -
8.1. <i>Directions for future research</i> .....	- 25 -
9. Bibliography.....	- 27 -
10. Appendices .....	- 38 -

## **Abstract**

The corporate world is constantly changing, and companies are increasingly shifting towards sustainable practices as a way to contribute to pressing societal and environmental issues. This research project uses a multiple-case study to explore the drivers behind four transformative companies dealing with energy based on a Harvard Business Review (2020) ranking. While internal and external sustainability drivers were distinguished, for the majority of the cases, external drivers influenced change at the beginning, but internal ones were decisive for the transformation to occur successfully.

**Keywords:** sustainability; multiple-case study; transformative companies; internal and external sustainability drivers

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## 1. Introduction

Change is inevitable. More than ever, this is happening in the business world as companies are starting to integrate sustainability into their business activities, implying that sustainability may be a cause of change (Shrivastava and Hart 1995, Kiron 2012). The notion of sustainability has evolved and has been widely sought as a new opportunity to spur innovations and competitive advantages (Hart 1995, Berns et al. 2009, Nidumolu, Prahalad and Rangaswami 2013, Porter and Kramer 2011). It is even suggested that sustainability is critical for companies that want to change in the upcoming years (Stikker 1992, Lacy, Haines and Hayward 2012, Lee et al. 2013).

In this research, change will be reflected by four corporate transformations of the last decade from a report called "The Transformation 20" by Innosight (Anthony et al. 2019), which Harvard Business Review [HBR] (2020) translated into a ranking (see **Appendix 1** for the ranking). The cases that will be considered are **Ørsted**, **Neste**, **Siemens**, and **Schneider Electric**, who have their businesses related to energy, a critical sustainability theme.

This work project aims at shedding light on the causes of corporate transformation in a sustainability context using a *multiple-case study*. For this, internal and external sustainability drivers will be analyzed as motivations for change to occur (Schrettle et al. 2014, Lozano 2015). The ultimate goal is to explore the importance of sustainability drivers, answering the research question: How do internal and external sustainability drivers differ in terms of importance during corporate transformation?

## 2. Literature Review

In 1987, the Brundtland Commission was considered a landmark with the concept of Sustainable Development and the idea that Earth's resources are finite. Future generations have the same rights in having the same opportunities as current ones. Dyllick and Hockerts (2002) adapt this concept referring to corporations. In this way, corporate sustainability refers to meeting "the needs of a firm's direct and indirect stakeholders (such as shareholders,

employees, clients, pressure groups, communities), without compromising its ability to meet the needs of future stakeholders as well.” This not only attracted policymakers to change but also business leaders and non-profit organizations (ibid.).

More recently, the Paris Agreement in 2015 reinforced the need to address climate change, proved by scientists that it is harming our planet and society if nothing ought to be done (UNFCCC 2015). The UN Sustainable Development Goals [SDGs] are part of the Agenda 2030 that highlights the importance and the need to address development worldwide and end poverty (United Nations s.d.). In parallel to these ideas are the debates between shareholder and stakeholder theory. There has been a shift from a profit maximization and short economic returns' mindset (Friedman 1962) to one that supports value creation if all stakeholders are considered (Freeman 1984).

Over the years, progress has been shown. A McKinsey survey has highlighted that firms are increasingly adopting sustainability practices into their business activities (Bonini and Görner 2011). In parallel, the Business Roundtable (2019), governed by influential American corporate leaders focused on profits for a long time, has recently announced its concern in recognizing the importance of all company stakeholders. Following this, one can see the commitment from Chief Executive Officers [CEOs] from over 12,000 companies worldwide shown in the United Nations [UN] Global Compact, the largest voluntary initiative comprising of ten principles regarding corporate sustainability practices (UN Global Compact s.d.). Indeed, Lee et al. (2013) suggest an increasing awareness of CEOs, who believe that sustainability has never been so important to be integrated at the strategical level to improve the business in the long run.

However, there are still challenges ahead, and companies are faced with the enormous challenge to adapt the way they do business that is sustainably viable in the future. As more studies show the importance of sustainability in a company's corporate strategy, sustainability has, indeed, become crucial for firms to change and develop their strategies (Stikker 1992, Lacy, Haines

and Hayward 2012, Lee et al. 2013, Lozano 2015). Undeniably, sustainability has become an opportunity for businesses to enter markets and gain competitive advantages (Nidumolu, Prahalad et Rangaswami 2013, Porter et Kramer 2011, Lubin et Esty 2010).

### ***2.1. Drivers of Sustainability***

Having introduced corporate sustainability and highlighted increasing sustainability practices, one can find the concept of drivers of sustainability, or sustainability drivers, in the literature (e.g., Epstein and Roy 2001, Mitchell and Walinga 2017, Lozano 2015, Schrettle et al. 2014 ). To better understand them, most studies separate internal drivers from external ones (e.g., Schrettle et al., 2014). The former focuses on the company itself and how it operates across its resources, strategy, and culture. The latter looks at how the outside influences the company across its reputation, market incentives, and regulation (ibid.).

Going deeper into the **internal drivers**, companies' resources (e.g., financial, physical, human, and organizational assets, and cost savings are decisive for productivity growth and innovation due to environmental practices (Barney 1995, Horbach, Rammer and Klaus 2012, Pablo, Sharma and Vredenburg 1999). From this, the overall strategy of the company is determinant for how sustainability will be integrated. This may include the objectives, mission, and vision, and it all depends on the importance that this is being given (Etzion 2007, Schaltegger and Burritt 2005). Finally, culture suggests that employees' motivations, leadership attitude, commitments, and a long-term vision are critical to sustainability (Schrettle et al. 2014).

In contrast, **external drivers** can help increase corporate reputation and credibility amongst stakeholders and the general public (Hopkins 2002, Oskarsson and von Malmberg 2005, de Leaniz and del Bosque 2013, Lozano, 2015). Related to this are the market drivers that influence companies' sustainability performance. These may be stakeholders such as competitors, customers, shareholders, or access to markets and customers (Rivera-Camino 2007, Frankental 2001, Quazi 2001). Focusing on customers, they have become more aware of

environmental concerns and are willing to pay a premium on sustainable products (e.g., Baron 2001, Servaes and Tamayo 2013). For instance, a survey conducted by Nielsen (2015) concluded that 66% of consumers worldwide are indeed willing to place more of their money on sustainable brands. Finally, the role of environmental legislation and regulation is crucial for sustainability since firms have to comply. Otherwise, penalties, fines, and legal costs can be harsh in reputation, financials, and overall functioning (Bansal and Roth 2000, Cordano 1993, Delmas and Toffel 2008, Banerjee 2001). However, empirical evidence has shown a positive impact on profitability and growth by complying with regulations (Banerjee, 2001).

Although there is a difference between internal and external drivers, Lozano (2015) goes further. He created a corporate sustainability model (see **Appendix 2**) that touches upon the above mentioned internal and external drivers and equally ‘connecting’ drivers, which attempt to understand better how corporate sustainability drivers operate. From this study, leadership is the main sustainability driver but externally, reputation, customer demands, expectations, and regulation prevail (ibid.).

### **3. Research Question**

Despite the important advances in the literature, this study should be considered as a contribution to a deeper understanding of the relationship between internal and external drivers of sustainability and how they affect transformation. It is important to address this because as companies are continuously changing, drivers may have different levels of importance in their transformation processes. Namely, considering that drivers are distinguished internally from externally. In that case, this may imply that specific ones are determinant at the beginning of transformation, but others may be more important later. A hypothesis may be that external forces coming from regulation or market opportunities trigger transformation. In light of this, the purpose of this study will be to answer the question: How do internal and external sustainability drivers differ in terms of importance during corporate transformation?

## 4. Methodology

### 4.1. Research design

To answer the research question, a multiple-case study studying four cases will be adopted that follows a replication logic, and thus, cases are first treated independently (Yin 2014). This shall be an exploratory and qualitative study (Robson 2002, Thomas 2003). A multiple-case study is adequate to address the research question because by analyzing four cases first independently, patterns may later be found. These may shed light on sustainability drivers' literature and be important for companies that want to transform soon.

The analysis sample focuses on four companies with energy-related businesses, but not all are from the energy industry. Precisely, **Ørsted**, **Neste**, **Schneider Electric**, and **Siemens** were chosen. These were selected from a Harvard Business Review [HBR] (2020) ranking (see **Appendix 1** for the ranking) retrieved from a report called “The Transformation 20” (Anthony et al. 2019). This report presents the twenty most innovative and transformative companies of the last ten years in new growth areas, repositioning the core business, and financial performance. **Appendix 3** presents a general overview of the sample, and **Appendix 4** depicts each company's transformation story in more depth.

This sample was chosen because of several reasons. First, only one context is at stake, energy, making comparisons more interesting than if they were from different contexts. Second, energy is a critical sustainability area and the seventh UN SDG. As there are still 789 million people worldwide who do not have access to electricity, our economies are equally dependent on energy to grow (United Nations 2020). Finally, these companies' transformation stories differ, yet, their change is intended to contribute to a more sustainable economy, making comparisons and differences interesting.

### 4.2. Data Collection

Data were retrieved from both primary and secondary sources. The main secondary source was



documentation such as reports, studies, newspapers, and the Innosight report (Anthony et al. 2019). To complement, seven interviews were conducted to identify the interviewees' perspectives of the potential drivers of transformation (see **Appendix 5** for a data source table per case, and **Appendix 6** for the interview guide).

### ***4.3. Data Analysis***

After treating the four cases independently, three different tables will be constructed. The first shall separate each case's internal and external drivers. The second will be a data structure inspired by Corley and Gioia (2004) to present the study's overall findings, regardless of the case. This structure is divided into three parts. Namely, the **first-order concepts** are where all the drivers are provided. However, to better process and interpret this information, the **second-order themes** categorize the previous stage's ideas. The **aggregate dimension** simplifies data even more, ultimately distinguishing internal from external drivers. However, because this research's core is related to each transformation case's timeframe, this shall also be constructed considering each case's significant events and drivers.

## **5. Findings**

### ***5.1. Ørsted***

#### ***5.1.1. Transformation Story***

In 1973, the Danish Oil and Natural Gas [DONG] was founded as a state-owned company for Denmark to be less dependent on oil and gas (Ørsted s.d.). Two decades later, a focus on renewable energy emerged, and the world's first offshore wind farm was created (ibid.).

In 2006, the company decided to follow a path towards the energy sector, slowly leaving oil and gas, which equally resulted in a different name to DONG Energy after a merger of six energy companies (ibid.). Nevertheless, it only took two years for the company to go further in energy, this time to renewable energy. This shift's primary strategy included significant investments in offshore wind farms' creation and development in Denmark and other

geographical places (Ørsted s.d.). As renewable energy had become the main focus, and as proof of Ørsted's ambition to expand and grow, in 2016, the company got listed on the stock exchange. Finally, a complete divestment of oil and gas businesses was made in 2017, leaving the company with a complete focus on renewable energy. Given these changes, it made sense for the company to change its name to Ørsted (ibid.).

This story shows profound and radical transformations as Ørsted is considered the most sustainable company in the world from the 100 world's most sustainable companies ranking (Corporate Knights 2020). Most impressive, green, or renewable, energy is now cheaper than energy from fossil fuels, and Ørsted's share of offshore wind power accounts for over 25% worldwide (Ørsted s.d.). Looking at the HBR ranking, the company is in the seventh position out of the twenty, but the most transformative European one, and 93% of its operating profit come from offshore wind farms (Anthony et al. 2019). In terms of financial benefits, from 2013 to 2018, revenue increased by 6.5% and operating profit by 1325% (ibid.). Ever since Ørsted became public, its growth is proof that investors were convinced that renewable energy would be a solution to mitigate carbon emissions (Gronholt-Pedersen, Mikkelsen and Skydsgaard 2016).

While numbers suggest positive results, Ørsted wants to keep improving in the future (Bøss 2020). Since 2006, Ørsted's coal consumption has been reduced by more than 80% (see **Appendix 7**), but the company has more ambitious targets to be implemented (Ørsted s.d.). For instance, the company wants to phase out coal entirely by 2023, be carbon neutral by 2025, provide green energy to 50 million people by 2030, and be carbon neutral by 2040 (Ørsted s.d.).

### **5.1.2. Drivers**

The first and predominant driver for Ørsted's transformation from fossil fuels to renewables is related to *climate change awareness* stated by Jakob Bøss, the Senior Vice President of Corporate Strategy & Stakeholder Relations (Bøss 2020). It is now safe to say that human-

induced climate change is causing harm to our planet and our society in many dimensions, which is why scientists have agreed that an increase in global temperatures should not exceed 1.5°C (UNFCCC 2015).

However, the increasing awareness of human-induced climate change is not new. For instance, the scientific community behind the Intergovernmental Panel on Climate Change was founded in 1988 to guide policymakers with technical information about how to best tackle climate change in their economies. At the beginning of the 2000s, the famous Stern report equally came to put more pressure on the danger of climate change from an Economics' perspective and how developing countries shall suffer the most if nothing ought to be done (Stern 2006). Finally, the 2006 documentary film called "An Inconvenient Truth," narrated by the activist Al Gore about global warming in the United States, increased awareness around the topic (Gore 2006). These three examples illustrate the pressure and incentive that fighting against climate change was for Ørsted's transformation, according to Bøss (2020).

Later in 2009 came the European Union [EU] 2020 Energy and Climate Change package with three main *energy targets* for EU member states. Namely, a 20% cut in emissions, 20% of EU energy from renewables, and 20% improvement in energy efficiency (European Commission s.d.). These goals were not only binding, but they equally meant that there was a market opportunity in renewables to explore (Bøss 2020).

Another factor was found in an interview with Martin Neubert, Executive Vice President and Chief Executive Officer [CEO] of offshore wind, by a McKinsey Senior Partner in Oslo. Neubert highlighted the importance of climate change in this process. However, he also stated that the *failure* of a coal-fired power plant project, Lubmin, in Germany back in 2008 was an incentive for the company to rethink its strategy in choosing renewables due to local protests (McKinsey 2020). This implies that failure from previous projects is equally crucial for change, given that it makes one think through alternative paths to take.

On a different note, the current CEO, Henrik Poulsen, in making this transformation happening, is of equal importance when he joined in 2012. Having realized that there would be many risks in the company's rebranding, the ball was in his court to go through the change towards renewable energy and, more precisely, offshore wind. Given this success, one could argue that he is an excellent example of a *visionary, persistent, and ambitious leader* who can make a real impact on our planet and economy (Hanson 2019).

## **5.2. Neste**

### **5.2.1. Transformation Story**

Neste is a Finnish company in the energy industry and has transformed towards renewable fuels. The company was founded in 1948 for the country to ensure its independence from the oil supply. Apart from oil and at that time, Neste expanded its core business to natural gas, exploration, and production, as well as chemicals (Neste s.d.).

In 1995, Neste got listed on the stock exchange, and in the 2000s, the company decided to focus on renewables by wanting to be a leader in renewable diesel production (ibid.). Thanks to its NEXBTL Technology, a platform that converts a wide range of renewable fats and oils into fuels, Neste was able to transform (Neste s.d.). In 2010, renewable diesel production started, and since then, Neste has continuously been challenged by this new area, taking the vital role of sustainability in its solutions (Neste s.d.). Indeed, the company is in the third position from the ranking by Corporate Knights (2020).

Currently, Neste operates in a wide range of sectors in which renewable fuels are crucial. More precisely, in aviation, transportation, polymers and chemicals, and oil products. However, it also uses platforms to manage raw materials and production capacity providing services for businesses to increase their sustainability activities (Neste s.d.).

Neste's transformation has become so impactful that it is now considered the most extensive renewable diesel producer worldwide (Lipponen 2018). Its customers' impact is located in

different geographical areas and has cut 9.6 million tons of greenhouse gas emissions in 2019 (Neste s.d.). Referring to the HBR ranking, Neste is the twelfth most transformative company, of which 70% of its operating profits have resulted from renewables, given a total revenue of \$17.2B (Anthony et al. 2019). As renewables shall keep contributing in the upcoming years, Neste is also engaged in reducing its customers' emissions by 20 million tons by 2030 and being carbon neutral through production by 2035 (Neste s.d.).

### **5.2.2. Drivers**

From an oil refiner to a renewable diesel producer, this transformation was possible thanks to the *technology* that allowed this conversion of fats and oils into fuels. During the interviews, one important event was the critical role of a *Research and Development* [R&D] team in the 1990s that started to investigate renewable fuel solutions. This was seen as the turning point towards sustainability, even though it was not practiced for several years (Peltonen 2020). As a result, one could argue that apart from the technology in renewable solutions from the 2000s and the importance of R&D, the technical expertise, creativity, and innovative participation of Neste's *employees* was crucial from the beginning of this transformation.

Adding to this was the increasing awareness of climate change and environmental concerns, leading to an increasing demand for sustainable solutions from *customers* (Lehmus 2020). In an interview with the current CEO Peter Vanacker, the latter claims that ten years ago there was no market in renewable products nor diesel, except an increasing awareness of environmental concerns and the realization that people are driven by a purpose (CNBC 2019).

This purpose was created by Neste at an early stage, back then, with the idea of “leaving a healthier planet for our children, for the next generation.” Consequently, this attracted more motivated employees, and all solutions created from then onwards would be developed around that idea (ibid.). Aligned with this is customers' role in wishing to live on a healthier planet, thus wishing for more sustainable solutions (Lehmus 2020). Finally, related to the purpose was

the *persistent and ambitious board* who created it and who made sure that it was a consistent message spread to the public and inside the company (ibid.). Indeed, the board's role in the transformation is claimed by Mr. Lehmus as one of the most critical drivers.

Following how ten years ago, there was no market for renewable products or renewable diesel. One can argue that investing and focusing on this area was an additional opportunity for Neste to transform. However, still related to the market conditions, Manzoni et al. (2018) highlight how the oil and share prices in 2008 dropped significantly. They went from \$140 per barrel to \$35 and a share price of €55 in 2008 and 2009 €8, which means that Neste had the *opportunity* to diversify its portfolio and had the financial resources to invest €2 billion in renewables.

A final driver is *about regulation*. More precisely, the impact of the 2009 EU Energy and Climate Change Package in which all countries and, in this case, oil companies had to fulfill a certain amount of bio in fuel (Lehmus 2020; Peltonen 2020). Once again, this was an incentive and an opportunity for Neste to transform to renewables.

From the interviews, although Lehmus (2020) claimed that the board's fundamental role in making this change happen was crucial, Peltonen (2020) emphasized the role of external stakeholders in allowing the company to listen, understand, and make real change happen.

### **5.3. Siemens**

#### **5.3.1. Transformation Story**

Siemens is a German multinational conglomerate that was founded in 1847 and has been continuously changing ever since. From developing a new model of a pointer telegraph in the 19<sup>th</sup> century to being a conglomerate, this multi-industry company operates in a wide range of areas, including industry, infrastructure, energy, smart mobility, and healthcare (Siemens 2019). However, the transformation touched upon in the Innosight report goes back to 2014, from energy and industrial manufacturing to digitalization, thanks to its 'Vision 2020' plan (Anthony et al. 2019; Siemens s.d.).

Vision 2020 aimed at strengthening Siemens' areas of electrification, automation, and digitalization, reduce costs, and improve customer satisfaction (Siemens s.d.). Concerning sustainability, the idea is that digitalization opens the possibility of developing innovative technologies that can provide more environmentally-friendly and efficient solutions to our societies, cities, and, subsequently, the planet. In parallel, its "Ownership Culture" sheds light on the importance taken to the company's employees in contributing to this transformation being successful (Siemens s.d.).

Both Digital Factory and Process Industries were two new business divisions that allowed the company to transform digitally and grow over the years (Anthony et al. 2019). The fiscal year of 2016 was decisive in sales revenues, orders, and profit, meaning that Vision 2020 substantially benefited the firm in its transformation (Siemens s.d.). Overall, 26% of the company's revenue came from these two business divisions (Anthony et al. 2019).

As the thirteenth most transformative company (HBR 2020), Siemens has gone through a digital transformation. Nevertheless, given that by 2017 the seven main goals set from Vision 2020 were achieved (see **Appendix 8**), in 2018, Vision 2020+ was announced with more robust and longer-term goals as proof of higher commitment from the company to strengthen its transformation in terms of intelligent and, sustainable solutions (Siemens 2018). Siemens is ranked the 41<sup>st</sup> most sustainable company (Corporate Knights 2020). However, with this new plan, sustainability became a bigger priority for the company to evolve with commitments to addressing the UN SDGs and the Paris Agreement in terms of de-carbonization goals by 2030 through its innovative technologies (Siemens s.d.; Siemens 2019).

### **5.3.2. Drivers**

Throughout this digital transformation, Chief Operating Officer of Digital Industries, Jan Mrosik, confirms how Siemens saw the opportunity in the digital sector and the technological advances that have been occurring in the past years (Insights Team Teradata 2019). As this

suggests that we live in an era where *digitalization* is a market opportunity, *technology* in itself must be seen as the enabler for all this change, which started to appear in the 2000s (Kaeser 2018; Evans 2011). Thanks to the advances of artificial intelligence, the Internet of Things, and computing speed, technology reduces costs, provides more efficiency, and a higher performance speed (Insights Team Teradata 2019). This was equally one of the most important factors mentioned by Matthias Goldstein, the current Vice President of Cloud Application Solutions at Siemens Digital Industries, in an interview (Goldstein 2020).

However, digitalization was not the only market opportunity since increased *urbanization* and *demographic change* were also essential factors, according to Goldstein (2020). These should be seen as opportunities resulting from social changes. Intuitively, with an increased German population at the time, there was pressure in terms of demand for infrastructure and development of urban cities (ibid.). Worldwide, urban areas are the most populated. With migrations from rural to urban places, and overall population growth, the percentage of urban areas is even likely to increase in the upcoming years (United Nations 2018). Thus, another market opportunity for Siemens to shift.

Related to Siemens' technology, this was only possible thanks to previous and significant *acquisitions* that the company made. Acquisitions started in 2004, but a key one is UGS Corp. in 2007, allowing Siemens to develop its automation capabilities, especially in terms of hardware, software, and support for the Digital Factory in a single-use (Siemens s.d.).

Chronologically, one year later, Siemens launched its environmental portfolio focusing on renewable energy, energy efficiency, and technology, enabling environmentally-friendly solutions through a range of systems, solutions, products, and services (Siemens s.d.). With the increase of *climate change awareness* and *public pressure*, Siemens had the power to benefit its customers and cities, and the planet in the long-run (Goldstein 2020). Aligned to this, Siemens' corporate structure was also renewed with the creation of a Sustainability board to



better address issues of climate change, urbanization, and demographic change (Siemens s.d.). The *board* would ultimately be decisive for managing and deciding the best possible strategy for its transformation (Golstein 2020).

Following the board, another driver was the '*Ownership culture*' behind Vision 2020, emphasizing that encouraging each employee was imperative for the company to reach its achievements (Siemens s.d., Goldstein 2020, Kaeser 2015). As Barbara Humpton, CEO at Siemens US, explained in an interview for Innosight, everyone's participation and interaction at all management levels allowed Siemens to develop its solutions better. However, it was also an opportunity for employees to feel they impact the company (Humpton 2019).

Finally, it is essential to mention that Siemens has been confronted with several *compliance issues*, which have also been a way for the company to keep learning from its past mistakes (Goldstein 2020). One big event was in 2006, resulting from a corruption scandal worth over \$2.7 billion, while the company ended up paying \$800 million in a court settlement (Steinberg 2013). To take action, executives focused on reorganizing and redirecting the company's strategy (ibid.). Aligned to this, Vision 2020 and, now, Vision 2020+ keep paying particular attention to strengthening regulatory compliance (Siemens 2019).

#### ***5.4. Schneider Electric***

##### ***5.4.1. Transformation Story***

Schneider Electric is a French multinational, founded in 1836, that started in the iron and steel business but changed to electricity and is currently an essential player in the market. As of 2010, the company focused on software, critical power, and smart grid applications (Schneider Electric s.d.). The transformation referred by Anthony et al. (2019) is one whereby Schneider Electric decided to shift in 2012 from a hardware supplier to an energy management provider through an open IoT platform, which would only be launched in 2016 (ibid.).

Therefore, this company followed a digital transformation taking advantage of the Internet of Things with two main growth areas. The first was its EcoStruxure platform delivering IoT-enabled solutions to homes, buildings, data centers, infrastructure, and industries, which in 2018 amounted to 34% of year-over-year growth (ibid.; Schneider Electric s.d.). The main benefits are the efficiency, safety, reliability, sustainability, and connectivity provided. The second was its StruxureWare Software, an integrated software suite for operational management that brings together IT and other company systems (Anthony et al. 2019).

The ultimate goal was to bring energy efficiency into the market and end-consumers in a sustainable way. Indeed, this sustainability component is of utmost importance as it is part of the company's mission that is to "empower all to make the most of our energy and resources, bridging progress and sustainability for all" (Schneider Electric s.d.)

In light of this transformation, Schneider Electric is the fourteenth most transformative company from the HBR (2020) ranking and is the 29<sup>th</sup> most sustainable company (Corporate Knights 2020). In terms of revenues, between 2012 and 2018, there was a 3.3% increase (Anthony et al. 2019). Most importantly, 22% of revenue has resulted in the company's IoT-enabled solutions, implying that having decided to follow this path has payed-off (ibid.). However, the company is in a continuous transformation since, for instance, carbon neutrality is a crucial target by 2030.

#### **5.4.2. Drivers**

An interesting approach to explaining this transformation was suggested by Fernandes (2020), who highlighted that Schneider Electric had to think about the trends in *urbanization, industrialization, and digitalization*. Given these, the electricity market would be the right opportunity to contribute to a more sustainable economy in energy efficiency and optimization and greenhouse gas emissions, with electric cars and smart buildings. In this way, digitalization would be the 'highway' that would allow this strategy to go forward (ibid.). As soon as

digitalization would be implemented, products would shift to being smart with additional functionalities for further communication and connectivity, thus being more efficient.

However, the *opportunity of leveraging the digital and technological markets* from the 2000s was a crucial enabler for change, which several acquisitions contributed to this (Moine 2020).

One key example was the case of American Power Conversion in 2007, which has helped Schneider develop critical power, cooling, and IT Management (ibid.; Schneider Electric s.d.).

Another idea is that access to energy and digital is a fundamental human right, which is why the promotion and creation of innovative and sustainable solutions through digitalization was seen as a way to contribute to a sustainable future in terms of carbon neutrality and response to increased demand for electricity (Fernandes 2020; Houot 2020; Moine 2020; Schneider Electric 2020). Progress has been made since up to 50% of emissions from businesses' carbon footprint have been cut (Schneider Electric 2019). From this, pressure not only came from *climate change awareness* in which debates started around the mid-2000s but equally from *customers* and overall *stakeholders*, such as investors, who demanded more and greener products at a rapid pace (Fernandes 2020; Houot 2020; Moine 2020).

In terms of investors' pressure, companies' environmental, social, and governance [ESG] scores are usually the primary criteria for investors to make their investments (Refinitiv s.d.). While Schneider Electric's ESG combined score from 2013 until 2019 has been stagnant, its environmental and social pillars have improved (Eikon 2020; see **Appendix 9** for Eikon's full data). This suggests that the company has kept its efforts not to lose investors and shows that it is concerned with the three pillars.

To emphasize more commitment towards sustainability, Schneider Electric equally had to *divest* to ensure that its portfolio only included firms that promoted green energy (Fernandes 2020). In this way, like acquisitions, these were strategic decisions. However, a sustainability aspect was people's contribution to the company, mainly from *employees*. As Ms. Fernandes

(2020) stated, “companies' transformation must first come from its people's transformation.” Indeed, as claimed by Jean Pascal Tricoire, Chairman & Chief Executive Officer, “People are the greatest asset for advancing any company’s digital transformation” (Tricoire 2019). Most importantly, it is essential to highlight the critical role that the current CEO from 2006 and the Chief Strategy and Sustainability Officer, currently Olivier Blum, had to lead this change and make sustainability a priority for its strategy (Moine 2020).

While people were central to pivoting change, external factors seem the most determinant from the interviews conducted. More precisely, the pressing need to address climate change for the future and the need to satisfy external stakeholders such as customers and investors (Moine 2020; Houot 2020). Most importantly, there is the ambition of ensuring that digital solutions contribute to a sustainable and circular economy (ibid.).

To sum the information from all cases, a first table distinguishing internal from external drivers, and the most significant ones can be found in **Appendix 10** about each company. To generalize the findings, a data structure inspired by Corley and Gioia (2004) can be found in **Appendix 11**, ultimately separating internal and external drivers. However, given the importance of time during transformation in this study’s research, a timeline of each case’s key events and drivers was also constructed.

## **6. Discussion**

Ørsted is the most transformative company compared to the others. The latter changed its portfolio entirely from fossil fuels to renewables, but from a European perspective, it is also the most transformative company, according to Anthony et al. (2019). Most impressive, Ørsted is considered the world’s most sustainable company, with profound efforts and ambition in addressing climate change (Corporate Knights 2020, Bøss 2020).

Indeed, the need to combat climate change was the most important external driver for its transformation (Bøss 2020; McKinsey 2020). However, the CEO Henrik Poulsen's critical role

since 2012 and the entrance to the stock exchange in 2016 are internal factors decisive for the company's transformation and expansion. This suggests that, from a time perspective, the external driver of climate change was one of the main that spurred transformation. However, internal drivers were vital for the functioning of the company's financial, leadership, and strategic decisions (see **Appendix 12** for Ørsted's transformation timeline).

Certainly, getting Ørsted listed on the stock exchange allowed the company to financially grow. For instance, wind farms in the United States have recently started to increase, but most importantly, investors have noticed about the significance of investing in sustainable solutions. From a different perspective, it is interesting to see that as an initial state-owned company, the state remains with the majority of shares to maintain its primary influence and to show stability inside the company (Ørsted 2020). Curiously, this is the same case for Neste, which became public in 1995 (Neste 2020). Given these cases, despite the transformation, these companies were cautious to maintain certain aspects of their structure.

In general, a critical pattern found is that all cases considered climate change an external driver. For instance, Bøss (2020) highlighted how reports from the IPCC, the one by Stern, and the documentary narrated by the activist Al Gore in the 2000s had contributed to important public debates, thus increased awareness. But, the important role of the United Nations, and more recently the Paris Agreement and the UN SDGs have also contributed to this awareness.

Namely, Ørsted, Siemens, and Schneider Electric found climate change as one of the most important drivers for their journey. This is likely because these companies' culture, mission, and vision were determined to transform and contribute to a better planet. Curiously, literature does not address climate change per se, unlike the interviews and research results. However, environmental concerns are linked to environmental legislation and regulation in the literature (see **Appendix 11** for this study's data structure), which Ørsted and Neste were driven by the EU Energy and Climate Change package in 2009 (Lozano 2015, Schrettle et al. 2014).

From this, one should be a critic about the extent of climate change as an indirect driver related to regulation. Because regulation is binding, one could argue that this environmental awareness may come from this obligation to comply. All the companies from this study aim to reduce their carbon footprint and be carbon neutral in the upcoming years. However, building upon EU regulation, carbon neutrality is part of a set of ambitious targets that countries must comply with. Looking differently, Ørsted and Neste's main shareholders are the state who, in this case, not only must comply with EU regulation, but equally defines its own environmental policies that are expected to be complied with for the best interest of their country. Overall, the argument that wants to be pointed out is the indirect relation between climate change and regulation from different perspectives.

Aligned to this, customer pressure resulting from increased environmental awareness was another important external driver across the sample and supported in the literature, except for Ørsted (e.g., Baron 2001, Servaes and Tamayo 2013). A reason why Ørsted was not affected by this may come from the fact that its main target was decreasing overall emissions. Nevertheless, in general, customers have become more aware of climate change, and thus, are becoming more selective in terms of what they are looking for in the market. Again, this awareness is likely due to important events that triggered public discussions such as in the 2000s, mentioned above, and the contribution of the United Nations with the SDGs.

It is noticeable that Siemens' Vision 2020+ plan set in 2018 prioritized even more combatting climate change, equally and likely influenced by the Paris Agreement's worldwide impact and the Agenda 2030 in 2015. Even though these are not binding, they have a significant weight across the international arena in terms of reputation. Again, we see that companies are prone to take reinforcing actions when there is environmental momentum. For instance, EU regulation influenced Ørsted and Neste, and now Siemens with its new plan of action.

It is interesting to explore why Neste did not prioritize climate change as a driver in its transformation, although it was considered. As a company that focused on leveraging new technology in translating fats and oils into renewable fuel, in the 2000s, this was likely the initial driver (see **Appendix 13** for Neste's timeline). Nevertheless, the board's role in paving the way for this transformation was highly pointed out by Lehmus (2020). Peltonen (2020) did not deny this but emphasized Neste's ability to listen, understand, and make a real change from external stakeholders. Although Neste considered regulation from the EU Energy and Climate Change package, like Ørsted, this only seems an additional opportunity to explore the renewable market, thus not considering climate change awareness per se as most important.

Overall, these arguments suggest that internal drivers prevailed for Neste, unlike for Ørsted. While the company's internal technological capabilities were the initial drivers, the role of the board and the company's ability to adapt according to external stakeholders' demand were decisive for the company's transformation. Comparing to Ørsted, one possible explanation may come from each company's culture and areas of focus. While Ørsted seemed determined to reduce greenhouse gas emissions, thus prioritizing climate change, Neste focused on its internal resources and capabilities to transform by having discovered a new technology.

Given mixed results from Ørsted and Neste, it is worth exploring Siemens and Schneider Electric's situation. First, unlike Ørsted and Neste, who transformed towards renewables, these two companies transformed digitally, but their core businesses already revolved around technology. Second, their initial drivers were the market opportunities in digitalization and technology and the social changes such as urbanization and demographic change from the 2000s, thus external (Insights Team Teradata 2019; Tricoire 2019). Third, looking closer into each company's transformation year, Siemens' prior renewal of the corporate structure in 2008 and the establishment of its "ownership culture," and Schneider Electric's executive board and the importance paid to its employees contributed a great deal to their transformation. Siemens'

timeline can be found in **Appendix 14**, and Schneider Electric's can be seen in **Appendix 15**.

All of this indicates that, like Ørsted, external drivers seemed decisive at the beginning of the transformation. However, the way this was managed over time depended on the board's role, on each company's objectives, and the culture, therefore internal.

In other words, all considered external drivers triggering their transformation and considered climate change awareness as the most important driver for them. Even though it is internal, Siemens equally considered technology capability (Goldstein 2020), and Schneider Electric focused on customer and investor pressure for Schneider Electric (Moine 2020; Houot 2020). See **Appendix 10** for a better representation of these findings according to each case.

External drivers may have less influenced Neste because it is the smallest in size and geographical scope compared to the others. While Siemens is a multinational conglomerate, Schneider Electric is significantly present in Western Europe, North America, Asia Pacific, and Ørsted has been strongly developing wind farms in the United States and Taiwan (Schneider Electric s.d.; Ørsted s.d.). Although Neste has a refinery in Singapore, it is the only non-European country it operates in (Neste s.d.). Further, because Siemens and Schneider Electric transformed digitally, their core competencies in technology were already there. Since this was not the case for Neste, leveraging technology was vital for the company's transformation. This suggests that the size of a company may be a factor influencing drivers in transformation.

Looking deeper into internal drivers, the corporate structure and strategic decisions' dimensions from **Appendix 11** were all more or less touched in the literature (Lozano 2015, Schrettle et al. 2014). Given the various vital roles of key people in the board, it was expected that the Chief Executive, Strategy, and Sustainability Officers would have a substantial weight in leading transformation. However, as the role of innovation, technology, acquisitions, and divestments are reasonable in terms of strategic decisions, an element not mentioned in the literature was the failure. In this case, Ørsted's German failed project. This may seem quite unusual, but it is



intuitive because one learns from the past that change may be needed. Failure can be seen as a wake-up call for transformation to occur.

Interestingly, reputation was not a driver found, even though it is one of the most important external drivers highlighted in the literature by Lozano (2015). A possible explanation may come from a bias from the interviewees not thinking about it at the moment or simply not finding it relevant to mention. Nevertheless, from findings, external pressure may be implicitly linked to reputation. In sum, local communities' discontent, customers, and investors are the three types of stakeholders that companies pressured according to the results.

From this, one can argue with Ørsted's failed project that the company changed not only for environmental concerns from the local communities' discontent, but also to gain more credibility among the general public. Second, regarding customers, the rationale behind this is that given increasing pressure from them in wanting solutions that are more environmentally friendly, companies are indirectly thinking about their reputation by reacting to this. Third, in terms of investors, the idea is that they are putting pressure on companies to provide more sustainable solutions to invest in them, thus increasing capital. While this is an increasing pressure for companies to respond quickly, it is also another way for them to increase their reputation. Overall, these are three ways based on how reputation plays an essential role for companies, even though it was not explicitly stated.

In sum, results show that the most critical driver is climate change awareness even though it was not explicitly stated in the literature, like reputation. Additionally, the majority of the companies were triggered by external drivers, namely climate change. However, for the whole transformation to be successful, internal drivers such as the board composition, leading CEOs, and overall employees were decisive. Neste is the only contrasting example, but it is the smallest company in size. With less geographical reach than the others, being triggered by internal technology capability also shaped the way the board would manage its transformation.

## **7. Limitations**

While it is expected that some findings support the literature and that additional points of discussion were found, it is essential to recognize this study's limitations mainly in terms of the data. First, it was difficult to find people to interview since this study only included a total of seven interviews. Mainly, for Ørsted and Siemens, only one person spoke on behalf of their companies, which increased even more, a bias about their opinions and ideas. Indeed, this is related to all interviews. Each person works for a particular department, so it is reasonable to assume that their feedback is biased according to their work area. Put differently, and given corporate executives' busy agenda, it would also be challenging to set an interview for a research project lasting six months.

From this, analyzing which drivers were most important during the transformation could be subjective, even though supported with other forms of data sources. Since time is an essential part of this study, it was equally difficult to estimate the exact year of events and drivers from each case to determine whether internal or external ones were triggering change at the beginning and afterwards. Finally, as interviews are essential in case study design, observations are equally relevant, which was unfortunately not possible in this study (Yin 2014). This was not only due to the pandemic situation of COVID-19, but it would have been not easy to set up visits at each company's site since not all have an office in Portugal.

## **8. Conclusion**

To conclude, this study was designed as a multiple-case study to extend the knowledge about the causes that led corporations to transform using sustainability drivers as points of reference from an HBR (2020) ranking. In light of these drivers, both internal and external ones were distinguished since change may originate inside the company or externally. With this, an in-depth analysis was conducted around four transformative companies in an energy context in

terms of their transformation story and drivers of change, considering the year since each company transformed.

To answer the research question, *how do internal and external sustainability drivers differ in terms of importance during corporate transformation?* It was concluded that, for most cases, external drivers of sustainability were crucial for disrupting change. However, internal ones were fundamental for transformation to be successful. Only one case differed, Neste, which internal drivers prevailed. But because it is the smallest company in size compared to the others, this may suggest that size is an influential factor to drivers.

Related to the literature, climate change awareness and reputation were not explicitly found in this study, although they are indirectly related to findings. Further into external drivers, regulation and customer pressure were found and linked to the literature. Internally, the companies' strategy, board, and resources such as financial or human were expected to match the literature, but failure, in this case of past projects as strategic decisions, was a finding as a wake-up call for transformation.

### ***8.1. Directions for future research***

For future research, transformation could be explored in Small and medium-sized enterprises given that the smallest company in terms of size of this study found internal drivers most important. With this, one could better understand the role of drivers depending on the size of the company. Adding to this, not all companies were from the same industry, so having a sample from the same industry could be relevant to explore. In parallel, since all companies were European, it could be interesting to explore companies from different geographical locations. Finally, regarding the drivers, it would be interesting to study better the implicit role that climate change awareness has on drivers such as regulation, and explore the role of failure in driving change.



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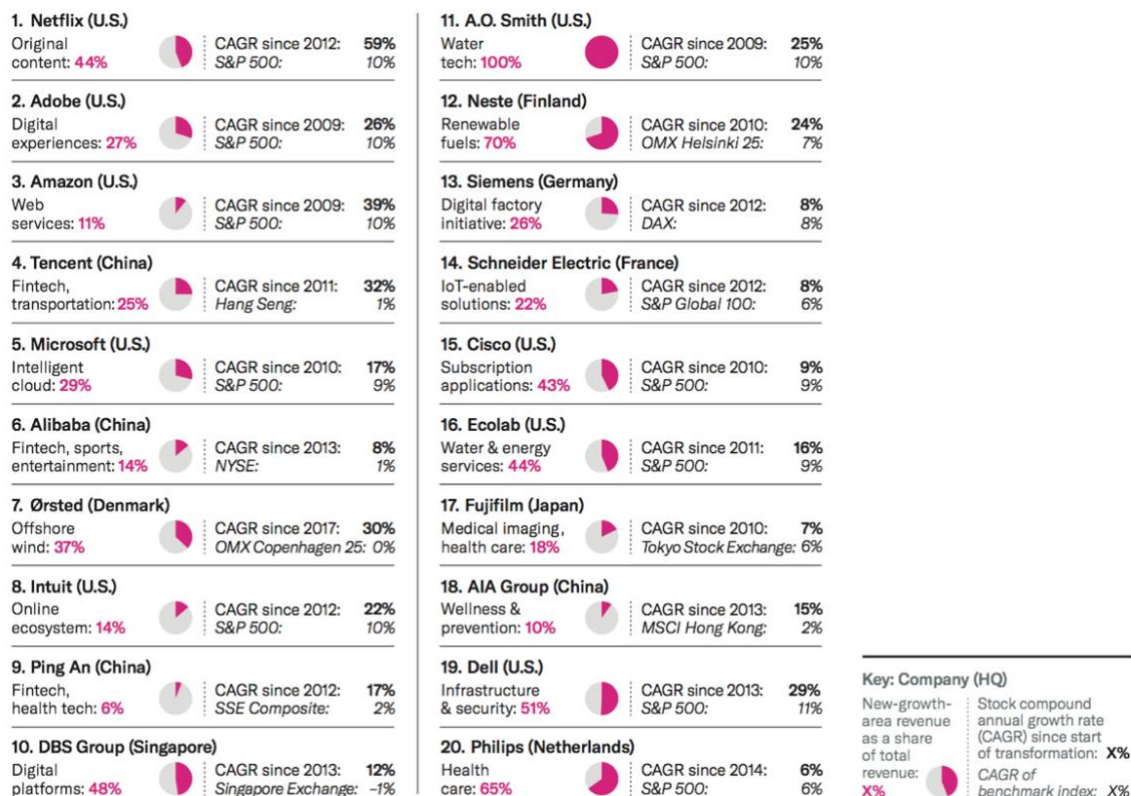
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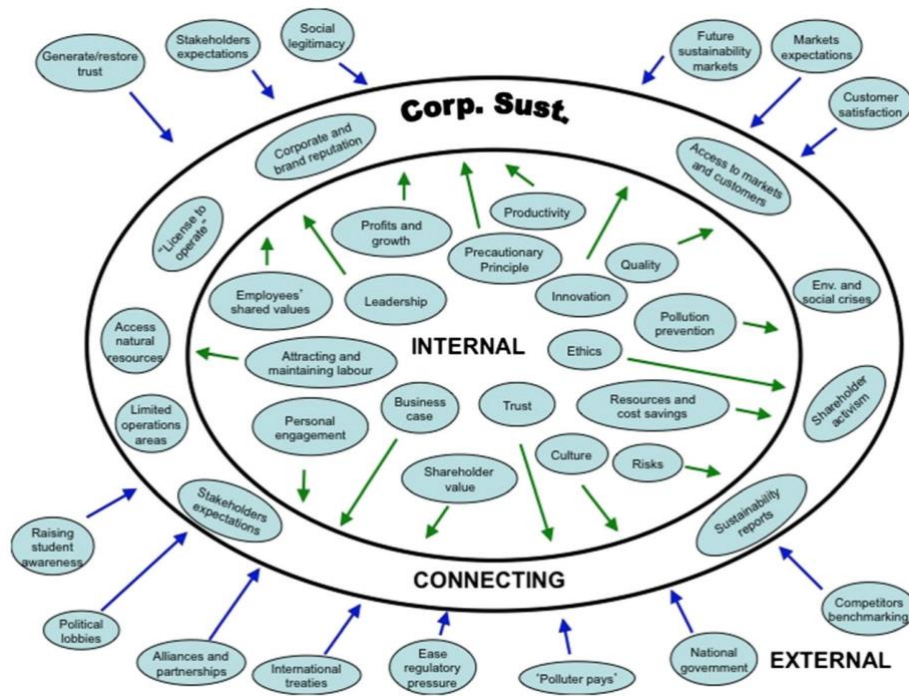
## 10. Appendices

### Appendix 1 The Transformation 20 (HBR, 2020)





## Appendix 2 Corporate Sustainability model (Lozano 2015)



### Appendix 3 Data sample adapted from HBR (2020)

Company	Nationality	Transformation since	Rank	Industry	New-growth- area	New growth area revenue as a share of total revenue	CAGR* since	CAGR of benchmark index
Ørsted	Denmark	2017	7	Energy	Offshore Wind	37%	2017 - 30%	OMX Copenhagen 25: 0%
Neste	Finland	2010	12	Energy	Renewable Fuels	70%	2010 - 24%	OMX Helsinki 25: 7%
Siemens	Germany	2012	13	Industrial	Digital factory initiative	26%	2012 - 8%	DAX: 8%
Schneider Electric	France	2014	14	Electronics/Industrial	IoT-enabled solutions	22%	2012 - 8%	S&P Global 100: 6%
							*Stock compound annual growth rate (CAGR) since start of transformation	

## Appendix 4 Transformation story from the data sample adapted from Anthony et al. (2019)

Company	Transformation Story	Strategy	New Growth	Core Business	Financials	Revenue Change
<b>Ørsted</b>	Moved from a state-owned oil and gas exploration and production company to stage a 2016 IPO as the largest offshore wind farm company in the world.	In 2017, Danish Oil and Natural Gas (DONG) changed its name to Ørsted and shifted its strategy away from gas- and oil-based energy production to green energy, aiming for 99% renewables by 2025.	Ørsted has invested in green energy assets since 2009 and is now expanding into North America and Asia. Its biggest investments are in offshore wind farms, which in 2018 accounted for DKK\$27.8B of its DKK\$30B in operating profit.	In 2017, Ørsted (formerly DONG Energy) divested its oil & gas production. Moreover, it decided to phase out coal completely as fuel at its power plants by the end of 2022. Onshore & offshore wind is rapidly becoming the new core. In 2018, the green share of Ørsted's energy generation reached 75%.	Revenue rose 6.5% from 2013 to 2018, while operating profit (EBITDA) increased 1325% over the same period. Profit margins improved from -2.2% in 2013 to 25.4% in 2018. Revenue CAGR: 1%, 2013-2018. Stock CAGR: 30% (vs. 0% for the OMX Copenhagen 20 Index), 2017-2018	93% of operating profit from Offshore Wind Farms
<b>Neste</b>	A regional oil and gas company transforms into a global leader in renewable biofuels.	Neste was established in 1948 as the state petrol company of Finland to ensure the availability of refined fuels. The company set out to make renewable biodiesel from hydrotreated vegetable oil.	Starting in 2005, shifted to producing renewable biodiesel, renewable jet fuels and renewable solvents, as well as raw materials for bioplastics. Renewables now account for nearly €1 billion in operating profits, 70% of its total.	Neste, at its core, produces, refines and markets oil products, provides engineering services and licenses production technologies. While revenue from oil products increased by 19% from 2017 to 2018 (68% of Neste's total revenue), the segment's operating profit declined by ~70% due to weak USD exchange rate and lower reference margin.	Revenue rose by 54.8% from 2009 to 2018, while net income surged by 246.2% over the same period. Profit margins improved from 2.3% in 2009 to 5.2% in 2018. Revenue CAGR: 5%, 2009-2018. Stock CAGR: 24% (vs. 7% for the OMX Helsinki 25 Index), 2010-2018	70% operating profits from renewables as % of total
<b>Siemens</b>	In 2014, Siemens announced Vision 2020, which detailed an organizational overhaul, restructuring and strategic shift from energy and industrial manufacturing to digitalization.	Vision 2020 saw Siemens shedding its traditional focus on oil and gas and industrial manufacturing, while adding new business divisions — Digital Factory and Process Industries — to transform into a digital and service company.	Since 2014, Siemens' Industries have gradually grown and contributed to the company's topline. Digital Factory's revenue increased by 14% between 2017 and 2018.	Even though Siemens is driving its focus away from industrial manufacturing and oil and gas, its core business in energy management, medtech, and industrial automation still contributed more than \$68.7B to the company's overall revenue in 2018.	Revenues increased by 10.7% from 2014 to 2018. Net income increased by 6.5%, from \$6.6B in 2014 to \$7B in 2018. However, profit margin declined from 7.7% to 7.4% during this period. Revenue CAGR: 3%. Stock CAGR: 8% (vs. 8% for the DAX index) (2014-2018)	26% of revenue from Digital Factory and Process Industries
<b>Schneider Electric</b>	Pursuing a digital transformation that would shift it from a pure hardware supplier to an energy management provider via an open IoT platform.	In 2012, Schneider Electric, a leading industrial maker of energy and smart grid hardware, placed a big bet on software and services as the company's future direction. In 2016, the company announced the launch of IoT-enabled solutions to make its offerings interoperable.	StruxureWare Software, an integrated software suite for operational management, bridges the gap between IT and other systems. EcoStruxure, a platform that delivers IoT-enabled solutions, reported a 34% YOY growth (2018).	Schneider Electric has introduced close-to-core offerings like energy dashboards, electric vehicles and smart cities. Medium Voltage contributed \$4.8B (17% of total revenue) despite a 4% decrease YOY. Low Voltage generated \$13B in revenue (45% of total revenue) with a 8.3% YOY growth. Secure Power contributed 14% of the total rev. and a 4.9% YOY growth in 2018.	Revenue rose by 3.3% from 2012 to 2018, and net income grew by 26.9% over the same period. Profit margins grew from 7.7% in 2012 to 9.4% in 2018. Revenue CAGR: 1%, 2012-2018. Stock CAGR: 8% (vs. 6% for the S&P Global 100 Index), 2012-2018	22% of revenue from IoT-enabled solutions

## Appendix 5 Data source table per case

<b>Ørsted</b>	<ul style="list-style-type: none"><li>- Jakob Bøss, Senior Vice President of Corporate Strategy &amp; Stakeholder Relations (Bøss 2020)</li></ul>
<b>Neste</b>	<ul style="list-style-type: none"><li>- Petri Lehmus, Vice President of Research and Development (Lehmus 2020)</li><li>- Heidi Peltonen, Team Leader of Sustainable Partnerships (Peltonen 2020)</li></ul>
<b>Siemens</b>	<ul style="list-style-type: none"><li>- Matthias Goldstein, Vice President of Cloud Application Solutions at Siemens Digital Industries (Goldstein 2020)</li></ul>
<b>Schneider Electric</b>	<ul style="list-style-type: none"><li>- Teresa Fernandes, Marketing Activation Director at International Operations in Portugal (Fernandes 2020)</li><li>- Xavier Houot, Senior Vice President of Sustainable Business &amp; Operations (Houot 2020)</li><li>- Veronique Moine, Director of Stakeholders Engagement &amp; Sustainable Performance (Moine 2020)</li></ul>

## **Appendix 6** Questionnaire Overview

### Questionnaire

Research about the causes that led corporate transformation from a sustainability lens

My name is Rita Fernandes and I am completing a Master's in Management at Nova School of Business and Economics in Lisbon. As a research topic for my thesis I want to explore the causes that led the most transformative corporations to change in a sustainability perspective. For this, I am going to create a multiple-case study and to, hopefully, find patterns in the end based on 4 companies retrieved from a Harvard Business Ranking.

1. General context of the transformation
2. If you had to say which were the causes and drivers that led to this transformation, which ones would they be?
3. Which ones do you think were more important in the process?
4. What have been the main challenges for this transformation?
5. Towards which path do you see the company going in the next years? Do you see more major transformations happening in the upcoming years and in terms of what?

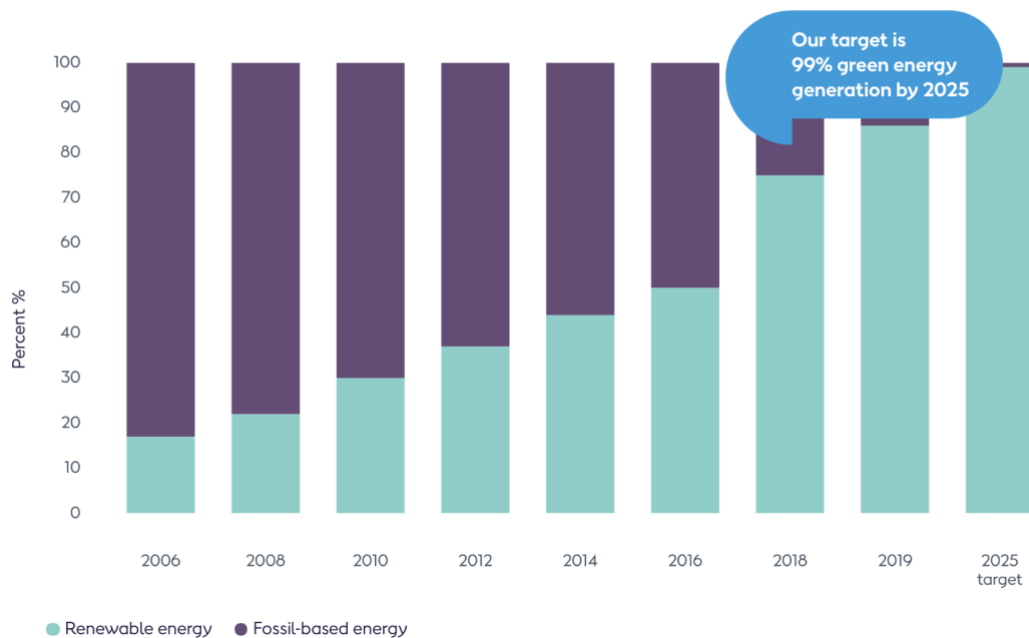
Thank you very much for your time. I would like to clarify if you consent all the information provided can be included in my thesis. Before submitting my thesis, I shall send it to you in case there is anything that you do not agree to be included in it.

## Appendix 7 Green Share of Power (Orsted s.d.)

### Green share of power

Green energy share in power and heat production








Energy sources in power and heat production



## Appendix 8 Goals of Vision 2020 largely achieved (Kaeser, Vision 2020+ Shaping the future Siemens 2018)

### Goals of Vision 2020 largely achieved



Goal	KPI	
<b>1 Implement stringent corporate governance</b>	 €1 billion in cost savings achieved by FY 2016	✓
<b>2 Strengthen portfolio</b>	 Tap growth fields > 8% margin in underperforming businesses	✓
<b>3 Execute financial target system</b>	 ROCE 15-20% Growth > most-relevant competitors	✓
<b>4 Expand global management</b>	 > 30% of Division and Business Unit management outside Germany	✓
<b>5 Be a partner of choice for our customers</b>	 ≥ 20% improvement in Net Promoter Score	✓
<b>6 Be an employer of choice</b>	 > 75% approval rating in "leadership" and "diversity" areas in global employee survey	✓
<b>7 Strengthen Ownership Culture</b>	 ≥ 50% increase in number of employee shareholders	✓


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Page 9 Munich, August 2, 2018

Press and Analyst Conference

## Appendix 9 Schneider Electric ESG score 2013-2019

Report History

**SCHN.PA** SCHNEIDER ELECTRIC SE  115.8500 EUR -0.9500 -0.81 % Vol 300,840 **CAM 94 CCR 88** Updated: 02-Dec-2020 12:13:23  
 France | Euronext Paris | Electrical Components & Equipment  
 Environmental, Social & Governance **ESG**

Overview News & Research Price & Charts Estimates Financials **ESG** Event Ownership Debt & Credit Peers & Valuation Derivatives Filings 360 Menu

ENVIRONMENTAL, SOCIAL, GOVERNANCE What's New Contribute ESG Data

Statement View

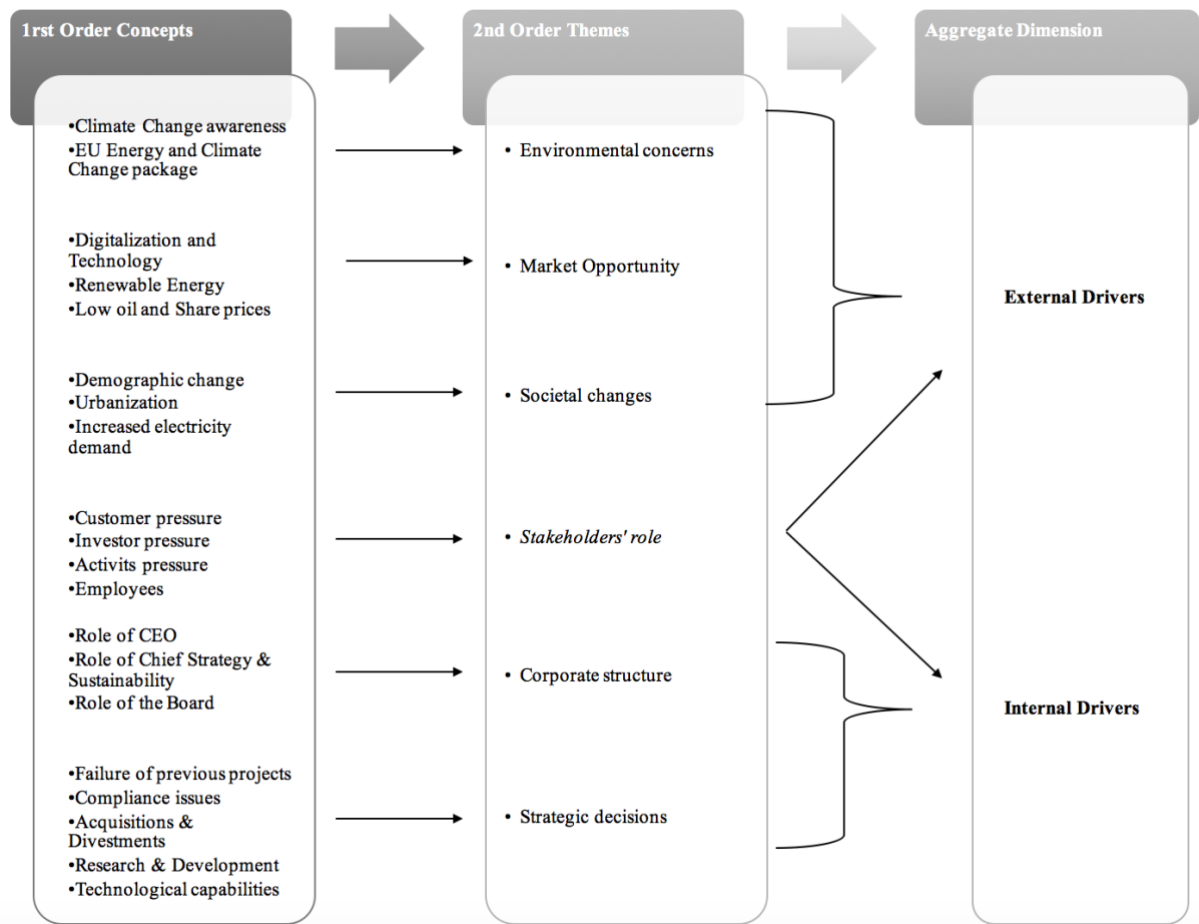
Scoring Measure	2019	2018	2017	2016	2015	2014	2013
Period End Date	2019-12-31	2018-12-31	2017-12-31	2016-12-31	2015-12-31	2014-12-31	2013-12-31
Reporting Currency	EUR	EUR	EUR	EUR	EUR	EUR	EUR
Period Status	Complete	Complete	Complete	Complete	Complete	Complete	Complete
ESG Report	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ESG Reporting Scope	90.00%	78.00%	12.00%	12.00%	11.00%	11.00%	12.00%
ESG Report Auditor Name	ERNST & YOUNG et Associes	Ernst & Young et Autres	ERNST & YOUNG et Associes	COFRAC	Eric Mugnier	Eric Mugnier & Bruno Perrin	Eric Mugnier & Bruno Perrin
ESG Combined Score	B	B+	B	B	B	B	B
ESG Score (Weight: 100.0%)	B	B+	B	B	B	B	B
Environmental Pillar Score (Weight: 34.2%)	B+	B	B	B	B	B-	B-
Social Pillar Score (Weight: 37.3%)	A	A-	A	A	A-	B	B
Governance Pillar Score (Weight: 28.5%)	C+	B+	C+	C+	C+	B+	B+
ESG Controversies Score	A+	B+	A-	A+	A+	A-	A-
Resource Use Score (Weight: 7.6%)	A+	A+	A	A	A+	A+	A



## Appendix 10 Drivers from each case according to findings

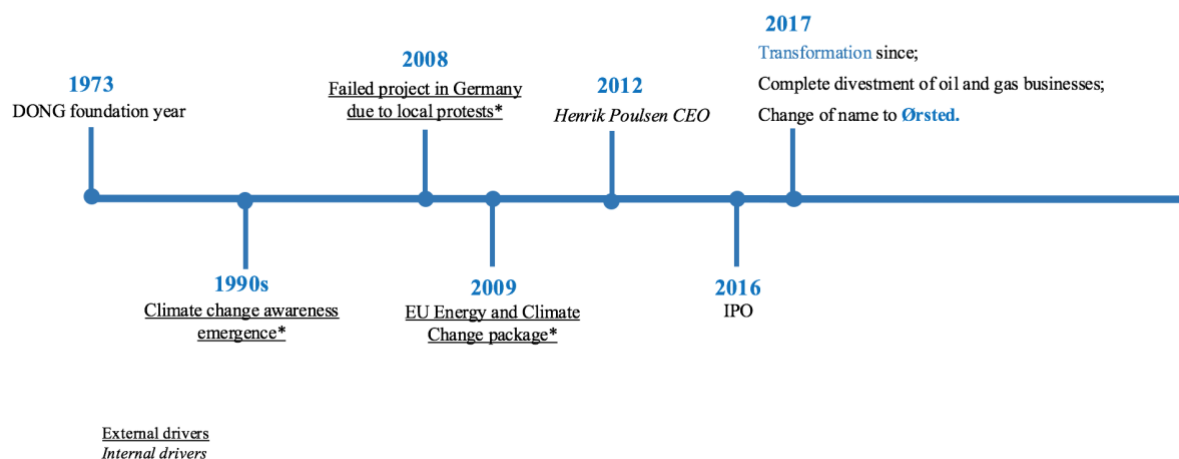
	<u>Ørsted</u>	<u>Neste</u>	<u>Siemens</u>	<u>Schneider Electric</u>
<i>External drivers</i>	<ul style="list-style-type: none"> <li>- <u>Climate Change awareness</u> that started to grow importance since the 1980s;</li> <li>- <b>Activists' pressure</b> as a result of local protests from German project;</li> <li>- <b>EU Energy and Climate Change</b> package set in 2009 as to address climate change, leading to a market opportunity in renewables;</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Low oil and share prices</b> in 2008 as an additional market opportunity for transformation;</li> <li>- <b>Climate Change awareness</b> started to be impactful in 2009 for Neste;</li> <li>- <b>EU Energy and Climate Change</b> package set in 2009 to address climate change, leading to a market opportunity in renewables;</li> <li>- <u>Customer pressure due to climate change awareness in terms of sustainable solutions;</u></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Digitalization and technology</b> as market opportunities to be focusing on (we are living on the Fourth Industrial Revolution);</li> <li>- <b>Demographic Change and Urbanization</b> as continuous phenomena paving the way for digital solutions that address societal needs;</li> <li>- <u>Climate Change awareness impactful as of 2008 for Siemens;</u></li> <li>- <b>Customer pressure</b> due to climate change awareness;</li> </ul>	<ul style="list-style-type: none"> <li>- Trends of Urbanization, Industrialization and Digitalization as <b>market opportunities</b>;</li> <li>- Increased <b>electricity demand</b> in the upcoming years (may double by 2040);</li> <li>- <u>Climate Change awareness to be impactful since 2005 at Schneider Electric;</u></li> <li>- <u>Customer and Investor pressures in terms of greener and sustainable products' demand as a result of climate change awareness;</u></li> </ul>
<i>Internal drivers</i>	<ul style="list-style-type: none"> <li>- <b>Failure</b> of the coal-fired power plant project in Germany due to local protests of environmental concerns in 2008;</li> <li>- Role of <b>CEO, Henrik Poulsen</b> in leading the transformation as of 2012;</li> </ul>	<ul style="list-style-type: none"> <li>- Technological solution first found in the 1990s that converts fats and oils into renewable fuel – important role of <b>Research &amp; Development</b> department</li> <li>- <u>Important role of the overall board in guiding the process of transformation;</u></li> <li>- Important role of <b>employees</b> in listening to external stakeholders about what they want and what should be done for improvement;</li> </ul>	<ul style="list-style-type: none"> <li>- <u>Technological capabilities as the enablers for transformation;</u></li> <li>- Acquisitions since 2004 have allowed Siemens to develop its <b>technology capabilities</b>;</li> <li>- <b>Compliance issues</b>, major corruption scandal in 2006 forcing Siemens to strengthen its compliance standards</li> <li>- Renewal of the corporate <b>board</b> in 2008 with creation of an environmental portfolio and its own Sustainability board;</li> <li>- <b>'Ownership Culture'</b> highlighting the idea that encouraging <b>employees</b> would be beneficial in driving transformation;</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Technological capabilities</b> in terms of the Internet of Things as the enabler for transformation;</li> <li>- Acquisitions have allowed Schneider Electric to develop its <b>digital capabilities</b>;</li> <li>- <b>Important role of CEO</b> since 2006 and later, <b>Chief Strategy &amp; Sustainability</b> in leading the transformation;</li> <li>- Important role of <b>employees</b> in driving transformation;</li> </ul>

## Appendix 11 Data structure inspired by Corley and Gioia (2004) of the findings



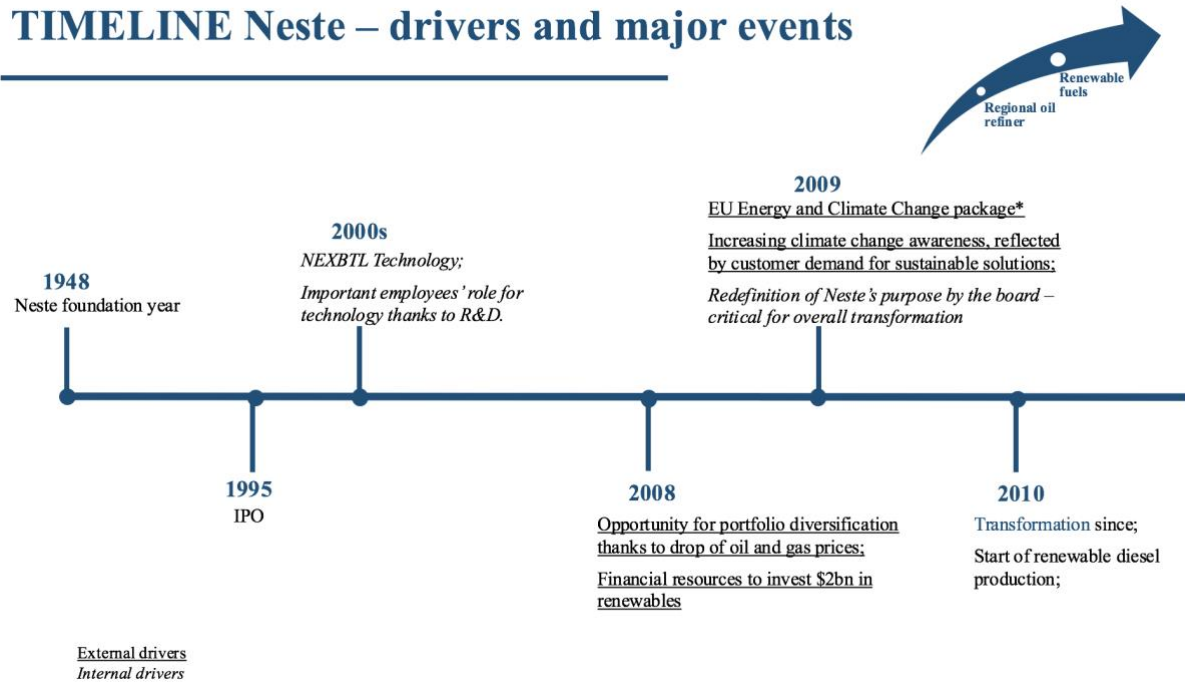
## Appendix 12 Ørsted's timeline

### TIMELINE Ørsted – drivers and major events



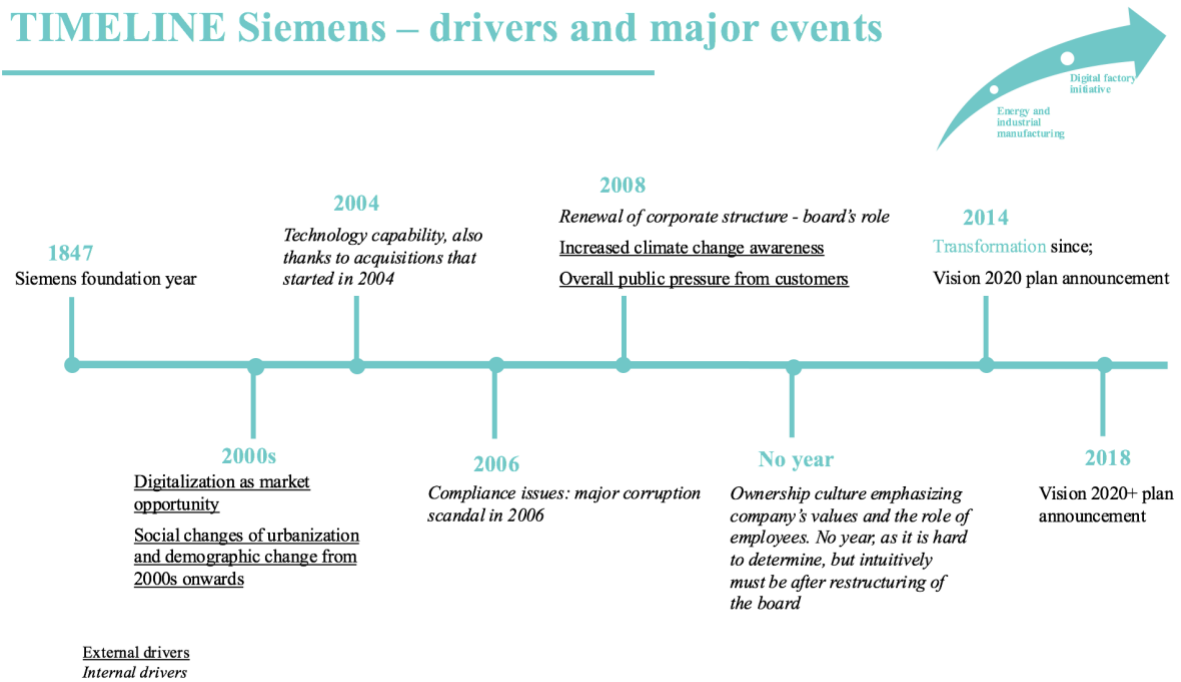
## Appendix 13 Neste's timeline

### TIMELINE Neste – drivers and major events



## Appendix 14 Siemens' timeline

### TIMELINE Siemens – drivers and major events



## Appendix 15 Schneider Electric's timeline

### TIMELINE Schneider Electric – drivers and major events

